## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE:

October 31, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Shell Cut, October 31, 2011," for your review. Please refer any comments you may have on the document to me by January 3, 2012. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

# SITE: SHELL CUT

Report Date: October 31, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Shell Cut was audited on October 31, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

#### 2.0 Parameters Audited:

#### T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	10/31/11					
Date of report.  Date:	10/31/11			Site name: S	Shall Cut	
Start:	11:10hrs.	рст			Steve Mobley	
Finish:	11:30hrs.			Project: S		
Audited By:	Mike Horn	131		Site Elevation:	3610	<del>4</del>
Witness:	Steve Mobley			Amb. Pres.:	897.50	
withless.	Steve Mobiley			Amb. Temp.:		deg. C
Prop. or Serial No.:	22869			Make:	R & P	deg. C
Type:	PM-10			Model:	1400ab	
Type.	T WI-10			Last cal. date:	8/17/11	
	<b>A</b> T T	DIT DEVICE(S)		Last Cal. Gate.	0/1//11	
Maka	BGI Incorporated	DII DEVICE(5)		Maka, I	OCI Incomposated	
	DELTA CAL				BGI Incorporated DELTA CAL	
S/N:	525			S/N:	525	
	2 - 20	lana		-		1
Range:	Calibration Factors	-		Range:	2 - 20 Calibration Factor	1
5	1.00	•			1.00	5
Slope: Intercept:	0.00			Slope:		
Cal date:	1/4/11			Intercept: Cal Date:	0.00	
Cai date:	1/4/11 Main:	Aux:	Camplan tampı		1/4/11	D:tt
Leak check:	0.080	0.290	Sampler temp: 18.0	<u>Diff.</u> -0.9	Sampler press: 895.49	<u>Diff.</u> -2.0
Dark current:	N/A	0.290 N/A	10.0	-0.9	895.49	-2.0
	Qa=[dPxTa/Pa] <sup>1/2</sup>	· ·	Site		NJamain al	Flow Rates
Audit	Audit Flo		Flow Rate	Diff.		
Point	ΔP, in. H2O	(VLPM)	(VLPM)		Lower Limit	Upper Limit
Point	ΔP, IN. H2O	(VLPMI)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.57	16.57	16.64	0.4	15.0	18.4
Bypass/Aux Flow Rate	13.57	13.57	13.65	0.6		
Main Flow Rate	3.05	3.05	2.99	-2.0	2.7	3.3
Total Flow Rate	16.63	16.63	16.64	0.1	15.0	18.4

Comments: None.

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	ent Variable	Evaluation Criteria
Wind Speed	1	At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direc	tion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatu	re	input $\pm$ 0.5° C Gravimetry Lab $\pm$ 1.0 deg. C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	umidity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	n	input $\pm 10\%$
Barometric	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi- PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

### Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	Р9	12/17/10	1.0	0.0
RM Young wind speed motor:	CU10, HS10	8/30/11	N/A	N/A
Psychro-Dyne Psychrometer:	RH 04	N/A	1 0	1 0
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

		Tapered	Element Osci	llating Microb	alance (TEOM	)	
		-0110-	FLC	DW AUDIT		DESCRIPTION OF THE PARTY OF THE	ar serving
						T	I
	111				000		
Date		//		Site Name	Shall	Cut	
Start		PST		Operator		mobile	
Finish	11.30	PST		Project	t: SB270	Y	
		-		Site Elevation	THE RESERVE AND ADDRESS OF THE PARTY OF THE	ft	T
				Amb. Press.		in. Hg	
			<del></del>	Amb. Temp.	18-7	deg. C	
Prop. Or Ser. No.:	22869			100	500		
	PM10				R&P		
77.		+ -		Last Cal. Date			<u> </u>
				Lust Car. Date	8/1/1/1		
		Audit	Device(s)	<del> </del>		<b>-</b>	ļ———
Make:	BGI INCOM	PODAT	ED.	Make	RCT THEO	DDODATES	<u> </u>
Model:	DELTA CAL	A AINM	Ψ	Model	- COLLING	KENKATED	
5/N:	0123 5	25	150	S/N:	LULLIA LA		
Range:	2 - 20	lpm		Range	111111	lpm	
Calibration factors:			Calib	ration factors:	2 - 20	·	
Slope:	1.0			Slope:	Committee and the committee of the commi		
Int.:	0.0/			Int.:			
Cal Date:	1/4/1/	,		Cal Date:	0.0	7-7-1	
	7 7			L		1	
Q <sub>a</sub> =m[d	PxT <sub>a</sub> /P <sub>a</sub> J <sup>1/2</sup> +b		Altitude Corr	ection Factor:	- 1013		
Look Object to the last							
Leak Check-Initial Leak Check-Final	Main:	.08	Aux:	.29			
Leak Check-Final	Main:		Aux:				
Audit	Audit Flow	Data	Site		Nominal F	low Rates	
Point		(VLPM)	Flow Rate	Diff.	Lower Limit		
Total Fow Rate	1/ <	(VEP IVI)		(%)	(LPM)	(LPM)	
Aux. Flow Rate	12.75		279/12.	65=16.6	4 15.0	18.4	
Main Flow Rate	13.3/		12:67				
Total Flow Rate	7100		9/1/1		2.7	3.3	
	16-63		1664		15.0	18.4	
			Stand	dard			
	Sampler		True	Raw			
Amb Temp	18.0			189			
Amb Press	. 884		895,49	8975			
			V	0.41.0			
Comments:							
Comments:							
1							
		0	/				

#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE:

July 15, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Shell Cut, July 15, 2011," for your review. Please refer any comments you may have on the document to me by September 15, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

## SITE: SHELL CUT

Report Date: July 15, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Shell Cut was audited on July 14, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

#### 2.0 Parameters Audited:

#### T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

# Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) $AUD\Pi \Gamma$

Date of report:	7/15/11					
Date:	7/14/11			Site name: S	Shell Cut	
Start:	12:00hrs. PS	ST		Operator: S	Steve Mobley	
Finish:	12:20hrs. PS	SТ		Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	3610	ft.
Witness:	Steve Mobley			Amb. Pres.:	885.80	hPa
				Amb. Temp.:	30.6	deg. C
Prop. or Serial No.:	22869			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
				Last cal. date:	5/11/11	
	AUD	IT DEVICE(S)				
Make: I	BGI Incorporated			Make: I	3GI Incorporated	
Model: I	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lp	em .		Range:	2 - 20	lpm
	Calibration Factors			(	Calibration Factors	8
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.090	0.260	29.0	-1.6	888.40	2.6
Dark current:	N/A	N/A				
(	Qa=[dPxTa/Pa] <sup>1/2</sup> +l	)	Site		Nominal	Flow Rates
Audit	Audit Flov	v Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.84	16.84	16.65	-1.1	15.0	18.4
Bypass/Aux Flow Rate	13.73	13.73	13.66	-0.5		
Main Flow Rate	3.00	3.00	2.99	-0.3	2.7	3.3
<b>Total Flow Rate</b>	16.86	16.86	16.65	-1.2	15.0	18.4

Comments: None.

### Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FI'S	108	9/8/10	0.41	0.6

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	<u>nt Variable</u>	Evaluation Criteria
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	tion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatui	re	input $\pm0.5^{\circ}$ C input $\pm2.0^{\circ}$ C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	n	input $\pm10\%$
Barometric	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi- PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

	T;	apered		llating Microba	lance (TEOM	100000 1000000000000000000000000000000	ORGANIZATION NOTATION
			FLC	TIQUA WO		STEELSTELSON IN	257 EM3 0 1
	Stut				1000	1	
Date				Site Name		at.	
Start		PST		Operator		moder	/
Finish	12:20	PST			: SB270		M
·		<del> </del>		Site Elevation		ft	
	<del> </del>			Amb. Press.	- A-V	in. Hg	
	<del> </del>	<del> </del>	<del></del>	Amb. Temp.	30.6	deg. C	
Prop. Or Ser. No.	22869		·	Make	Den		-
	PM10	-	1		1400a , ,		
1,100	11110		+	Last Cal. Date:	1		-
	<del> </del>			Last Cal. Date	5/4/	//	ļ
		Audit	Device(s)				ļ
Make	BGI INCOR			Make:	DOT THE	DDOD ATTER	ļ
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S/N:	0123 5	25		S/N:	LILL LET		
Range:	and the firm that the same of	lpm	<b></b>	Range:	- W. C.	Inm	
Calibration factors:	2 - 20	· Positi	Calib	ration factors:	2 - 20	ibin	
Slope:	1.0			Slope:		-	
Int.:	0.0 /		<b></b>	Int.:			
Cal Date:	1/4/11	15***	l	Cal Date:	0.0	<del> </del>	
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Q.=mfe	dPxT_/P_J1/2+b		Altitude Corr	ection Factor:	÷ 1013		
			Tritatade oon	T actor.	- 1012		
Leak Check-Initial	Main:	. 19	Aux.	.26			
Leak Check-Final	Main:	co,	Aux:	· 64.5		( ( )	
			Site		Nominal F	low Rates	
Audit	Audit Flow	Rate	Flow Rate	Diff.		Upper Limit	
Point	delta P	VLPM)	(VLPM),	(%)	(LPM)	(LPM)	
Total Fow Rate	1684		299/13	8.66 - 18	645.0	18.4	
Aux. Flow Rate	1373		13 66	- In / S	.63		
Main Flow Rate	3.00		2.99	,	2.7	3.3	
Total Flow Rate	16.86		16.65		15.0	18.4	
			Stan	dard			
	Sampler		True	Raw			
Amb Temp	29.0			30.6			
Amb Press	. 877		888.40	885.8			
			· · · · · · · · · · · · · · · · · · ·				i·
			68-00 YOA 116				
					1		
Comments:							

#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE:

May 10, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Shell Cut, May 10, 2011," for your review. Please refer any comments you may have on the document to me by July 11, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

## SITE: SHELL CUT

Report Date: May 11, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Shell Cut was audited on May 9, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

#### 2.0 Parameters Audited:

#### T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	5/10/11					
Date:	5/9/11			Site name: S	Shell Cut	
Start:	11:05hrs. P	ST		Operator: S	Steve Mobley	
Finish:	11:20hrs. P	ST		Project: S	SB 270	
Audited By:	Mike Horn			Site Elevation:	3610	ft.
Witness:	Steve Mobley			Amb. Pres.:	881.90	hPa
	ŕ			Amb. Temp.:	17.6	deg. C
Prop. or Serial No.:	22869			Make:	R & P	
Туре:	PM-10			Model:	1400ab	
<b>7</b> 1				Last cal. date:	2/23/11	
	AUD	OIT DEVICE(S)				
Make: I	3GI Incorporated			Make: I	3GI Incorporated	
Model: I	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lp	om		Range:	2 - 20	lpm
	Calibration Factors			_(	Calibration Factor	<b>'</b> S
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.100	0.250	16.1	-1.5	884.34	2.4
Dark current:	N/A	N/A				
(	$Qa = [dPxTa/Pa]^{1/2} +$	b	Site		Nominal	Flow Rates
Audit	Audit Flo	w Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.98	16.98	16.65	-1.9	15.0	18.4
Bypass/Aux Flow Rate	13.96	13.96	13.66	-2.1		
Main Flow Rate	3.07	3.07	2.99	-2.6	2.7	3.3
Total Flow Rate	16.94	16.94	16.65	-1.7	15.0	18.4

Comments: None.

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measuremer	<u>nt Variable</u>	Evaluation Criteria
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input $\pm0.5^{\circ}$ C input $\pm2.0^{\circ}$ C for PM-10, PM-2.5 samplers
Relative Hui	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	1	input $\pm 10\%$
Barometric l	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi-V PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### **AUDIT DEVICE**

THE STATE OF THE S	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

* ** ** ***				Air Pollution Co				
		apered		llating Microba	alance (TEOM)	Note Calabia and Care .	40 848 00	2 4
	1		FLC	TIDUA WC	1			
					0011	- N		
Deter	metal.	-			skelly	al		
Date:		-		Site Name	A // MA			
Start:		PST		Operator		mobil /		
Finish:	11.20	PST			: SB270	7		
		J		Site Elevation		ft		
				Amb. Press.	0 01	in. Hg		1
				Amb. Temp.	17.6	deg. C	9	
Prop. Or Ser. No.:	24925	2	2869	Make	: R&P			
Type:	PM10			Model	: 1400a ,			
				Last Cal. Date	2/23/1			
					12/20/11			
			Device(s)				1	1
Make:	BGI INCOR	PORAT	FD.	Make	BGI INCOM	RPORATED	1	-
Model:	DELTA CAL		1	Model:		JUNATED	<b> </b>	
S/N:	0123 5	25		S/N:	121 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	T		-
Range:	2 - 20	Ipm	1	Range:	- Walder	Ipm		-
Calibration factors:			Calib	ration factors:	2 - 20	-pitt		-
Slope:	1.0			Slope:				-
Int.:				Int.:	1.0.0			<del> </del> -
Cal Date:	010/11			Cal Date:	0.0-			-
- Juliani	1/4/16			Car Date.		ı		
0 =m[d	PxT <sub>a</sub> /P <sub>a</sub> J <sup>1/2</sup> +b		A 1614	L.,				ļ
G <sub>e</sub> -m[a	PXI PP +D		Altitude Corr	ection Factor:	-1013			
Look Cheek I-W-I								
Leak Check-Initial	Main:	.18	Aux:					***********
Leak Check-Final	Main:		Aux:					
			Site		Nominal F		=======================================	
Audit	Audit Flow		Flow Rate	Diff.	Lower Limit	Upper Limit		i
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		
Total Fow Rate	16.98		2.99/13.	66= 11	15.0	18.4		
Aux. Flow Rate	13.96		13.66	100	,			
Main Flow Rate	3.62		2,99	17 3.5.15.07 (7	2.7	3.3		
Total Flow Rate	16.94		16.65		15.0	18.4	* ***	
	10-21		7.0.5		1.34-20			
			Stan	dard				
	Sampler		True	Raw				
Amb Temp	1/01		15 /					
Amb Press	872		884.34	881.9				
	1.0.7.2		007.34	00/./				
		-						
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Comments:								
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#### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

#### MEMORANDUM

DATE:

January 26, 2011

TO:

Chris Lanane, Steve Mobley

FROM:

Mike Horn M

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Shell Cut, January 26, 2011," for your review. Please refer any comments you may have on the document to me by March 28, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

## SITE: SHELL CUT

Report Date: January 26, 2011 Prepared by: Mike S. Horn

#### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Shell Cut was audited on January 25, 2011. The audit was conducted by Mike Horn and was witnessed by Steve Mobley, who is the site operator.

#### 2.0 Parameters Audited:

T.E.O.M. PM-10

#### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

#### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

# Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) ${\bf AUD}\Pi$

Date of report:	1/26/11							
Date:	1/25/11			Site name: S	Shell Cut			
Start:	13:20hrs. PS7	[		Operator: 9	Steve Mobley			
Finish:	13:40hrs. <b>PS</b> 7	Γ		Project: SB 270				
Audited By:	Mike Horn			Site Elevation:	3610 ft			
Witness:	Steve Mobley			Amb. Pres.:	894.10 h	Pa		
				Amb. Temp.:	17.1 d	eg. C		
Prop. or Serial No.:	22869		€.	Make:	R & P			
Type:	PM-10			Model:	1400ab			
				Last cal. date:	11/5/10			
	AUDI	Γ DEVICE(S)						
Make: BGI Incorporated				Make: BGI Incorporated				
Model: DELTA CAL				Model: I	Model: DELTA CAL			
S/N:	525			S/N:	525			
Range:	2 - 20 lpn	า		Range:	2 - 20 lp	om		
Calibration Factors				Calibration Factors				
Slope:	1.00			Slope:	1.00			
Intercept:	0.00			Intercept:	0.00			
Cal date:	1/4/11			Cal Date:	1/4/11			
	Main:	Aux:	Sampler temp:	<u>Diff.</u>	Sampler press:	Diff.		
Leak check:	0.080	0.250	16.6	-0.5	892.45	-1.6		
Dark current:	N/A	N/A						
$Qa=[dPxTa/Pa]^{1/2}+b$			Site		Nominal F	low Rates		
Audit	Audit Flow	Audit Flow Rate,		Diff.	Lower Limit	Upper Limit		
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		
Total Flow Rate	16.86	16.86	16.64	-1.3	15.0	18.4		
Bypass/Aux Flow Rate	13.76	13.76	13.65	-0.8				
Main Flow Rate	3.00	3.00	2.99	-0.3	2.7	3.3		
Total Flow Rate	16.88	16.88	16.64	-1.4	15.0	18.4		

Comments: None.

### TABLE A-1

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measurement Variable		Evaluation Criteria				
Wind Speed		At ws ≤ 5 m/s, input ± 0.25 m/s; At ws > 5 m/s, input ± 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H				
		input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor				
Temperature		input $\pm$ 0.5° C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers				
Relative Humidity		Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%				
Precipitation		input ± 10%				
Barometric Pressure		Ambient: input ± 10 hPa TEOM: ± 10 mm mercury				
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%				
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%				
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM				

Appendix B

# GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

#### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	12/22/09	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		

4				Air Pollution Co Illating Microba				
				OW AUDIT	MATICE (TEOM		11 - 100 A A	50.7
				1	1	Т	-	
					111	1	<del> </del>	
Date	110 / ///			Site Name	11/1	1		
Start	13'25	PST		Operator		mobil	1	-
Finish	13:40	PST			: SB270	The state of the s		-
	1-			Site Elevation	:	ft	+	- +
				Amb. Press.		in. Hg		
				Amb. Temp.		deg. C		128
D 00 11			7				1	
Prop. Or Ser. No.:				Make				
Type:	PM10 /				1400a			
				Last Cal. Date:	11/5/10			
					7 7			
		Audit	Device(s)					
Make:	BGI INCOR	PORAT	ĘD	Make:	THE TOTAL	RPORATED		
woder:	DELIA CAL			Model:	DELTA CAL			
S/N:	0123 5,	45		S/N:	0123			
Range: Calibration factors:	2 - 20	lpm		Range:	2 - 20	lpm		
		ļ	Calib	ration factors:		10-ah -		
Slope:	1.0		ļ	Slope:	1.0			
Cal Date:	0_0_/_			Int.:	0.0-			
- Cai Date.	-4/11	1		Cal Date:		! !		
	ID. T. ID. 1/2.			I				
Q₃=m[o	IPxT <sub>a</sub> /P <sub>a</sub> J <sup>1/2</sup> +b		Altitude Corr	ection Factor:	÷ 1013			
Leak Check-Initial							,	1
Leak Check-Final	Main:	.08	Aux:	.25				
Lean Check-Final	Main:		Aux:					
Audit	Audit Flow	D-4-	Site		Nominal F			
Point		(VLPM)	Flow Rate	Diff.	Lower Limit			
Total Fow Rate		(ATLIAL)	(VLPM)	(%)	(LPM)	(LPM)		
Aux. Flow Rate	16:86		399/13/6	5 = 166	15.0	18.4		
Main Flow Rate	13.66		13.65					
Total Flow Rate	3,00		2.99		2.7	3.3	- 144	
	18.88		16.64		15.0	18.4		
			Stan	dond				
	Sampler		True	Raw				
Amb Temp	16.6		- True	171				
Amb Press	. 881		892.45	894.1				
	001		0/8:45	0.14.1				
							i	
		-						
								-
Comments:								-
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			/					
	0.	7	<b>Z</b>					